

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT

NO. 3552 MAP

GEOPHYSICAL REPORT ON

CHATAWAY EXPLORATION PROPERTY

UNDER OPTION TO:

CANADIAN SUPERIOR EXPLORATION CO.

3552

Claims: B 1-4; Chat 2-5 Fr's; Dot 9-17
25; Gav. 1, 2; H.O.R. 1-8; Lake 1,2,4 Fr's;
Len 2,4,6,9-16; Mar 1,3-8; Rob 3-8; Russ 7,8,
T.D.M. 21 Fr.

Location: 20 miles N.W. of Merritt, B.C.
50° - 120° S.W.

October 18, 1971 - January 30, 1972.

G. Brace

J. Murphy, P. Eng.

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INTRODUCTION

This report is concerned with an induced polarization survey completed upon property owned by Chataway Exploration Co. and under option to Canadian Superior Exploration Co. Ltd. This survey was conducted during the period October 18, 1971 to January 30, 1972 and was confined to an area known as the Northeast Quarter. Claims comprising the Northeast Quarter are as follows: Ant 1 - 8, B 1 - 4, Chat 1 - 5 fractions, Dot 1 - 26, Gov 1 - 14, 16 - 19, H.O.R. 1 - 8, Lake 1 - 4 fractions, Len 2, 4, 6, 8 - 16, Mar 1 - 8, Rex 1 - 4, Rob 1 - 8, Rose 1, 2, Russ 7, 8, T.D.M. 1 - 12, 21 fraction, 22, 25 - 30, Wiz 1 - 4, 34 - 41, 72 - 87.

The property is located approximately twenty air miles NW of Merritt, B.C. and in the Guichon batholith. It is accessible by four-wheel drive vehicle using the Chataway Lake fishing camp road from Craigmont Mines (approximately twenty-five miles from Merritt).

A list of personnel involved with the survey along with days worked and rates of salary is appended to this report as Appendix II.

Other related costs to this survey being applied for as assessment credits and the total survey expenditure are appended as Appendix III.

SUMMARY & CONCLUSIONS

An induced polarization survey conducted over the Northeast Quarter of the Chataway Exploration Co. claim block has indicated one anomalous resistivity feature, three zones of anomalous induced polarization effects, and four "one-line" induced polarization anomalies.

The anomalous resistivity feature consists of a north-south trending resistivity depression extending from the north end of Dot Lake to the northern limit of the survey grid. The depression is best developed from L318N southwards. To the north of L318N it becomes discontinuous and weak.

This feature is interpreted as being the resistivity expression of a fault and/or alteration zone. There is, however, no supporting geologic evidence for this interpretation.

Zone I is the largest of the three anomalous induced polarization effect zones indicated. It has a maximum length of 5400 ft. and width of 3000 ft.

The zone is characterized by a rather weak frequency effect responses (averaging 2.4%) which tend to be broad and continuous in the northern section of the zone and shorter and discontinuous in the southern section of the zone.

Although this zone has no direct, continuous resistivity correlation it is designated as the primary zone for future follow-up investigations for the following reasons:

1. it has a favorable strike length and width
2. it is positioned to the immediate west of a N-S trending resistivity anomaly which has been interpreted as being due to a fault and/or alteration zone.
3. it straddles or lies to the immediate west of an inferred geologic contact zone between the Chataway and Dot phases of the Guichon batholith.

Zone 2 appears on two lines only (L278N and L282N) and is positioned immediately north of Dot Lake and to the immediate east of the inferred geological contact between the Chataway and Dot phases of the intrusive.

Frequency effects across the zones are quite weak, averaging only 2.1%. They are, however, coincident with an appreciable resistivity depression which suggest a localized alteration or shear zone.

This zone has been given a secondary priority for future follow-up investigations.

Zone 3 occurs on two lines (L326N and L330N) in the northeast corner of the grid. This zone is characterized by very weak frequency effect responses (averaging 1.8%). It is, however, coincident with relatively low resistivity responses.

This zone has been given a low priority for future follow-up investigation.

Four "one-line" anomalies have been located on lines 290E, 278E, 274E, and 258E. These anomalies are of no further interest regarding future follow-up investigation due to their obviously limited size.

It should be noted at this point that although the induced polarization effects obtained in the anomalous zones are weak this was not entirely unexpected. The Highland Valley ore zones are noted for their paucity of total metallic sulphide content and their resulting weak induced polarization effects. As a case in point induced polarization responses over the main Highmont ore body vary from between 1.5 to 2.5 times background.

RECOMMENDATIONS

1. A magnetic survey should be conducted over the western half of the survey grid (from L274N to L330N) to determine:
 - A. the magnetic response of the induced polarization anomalies of Zone 1 and thus ensure that they are not wholly due to disseminated magnetite.
 - B. the magnetic expression of the anomalous resistivity depression.
2. A limited diamond-drilling program (900 ft.) be conducted in zones 1 and 2 to test the best induced polarization anomalies. This would consist of three drill holes each 300' in length and with the following co-ordinates:

D.D.H. #1: collar - 305 & 25N, 323 & 50E

azimuth - 316°

dip - 45°

D.D.H. #2: collar - 312 & 50N, 326 & 50E

azimuth - 316°

dip - 45°

D.D.H. #3: collar - 278N, 352E

azimuth - 295°

dip - 45°

HISTORY AND PREVIOUS TECHNICAL WORK

In 1962 the Chataway Exploration Co. was formed to acquire the interests of the Chataway Mining Syndicate, registered owners of 213 mineral claims in the Highland Valley area. Chataway Exploration Co. has since expanded the original claim block to now include approximately 480 mineral claims.

During the period 1962 to 1965 Chataway Exploration Co. conducted active exploration programs which include prospecting, geophysical and geochemical surveying, stripping and diamond drilling. With the exception of approximately 1600 ft. of diamond drilling and some trenching near Leroy, Antler, and Dot Lakes none of the exploration programs invested the Northeast Quarter.

Drilling in the Northeast Quarter was confined to Mar 2, 4, Rob 3, and Wiz 3 mineral claims. No significant copper mineralization was noted in any of these holes however, minor amounts of disseminated bornite were seen in the core obtained from Wiz 3.

In 1965 a high grade zone of copper mineralization in shears was uncovered, by trenching, just south of Gypsum Lake. This area, known as Zone 4, along with the remainder of the Southeast Quarter was subsequently optioned to Bralorne Pioneer Mines. In the following two years Bralorne Pioneer outlined, by stripping and drilling, a low tonnage, high grade copper occurrence. It was however, deemed uneconomic under the prevailing conditions and the option was terminated.

In 1968 Chataway Exploration Co. optioned 418 mineral claims to King Resources Co. King Resources subsequently initiated an intensive exploration program to obtain geologic data on the complete claim area, and geochemical and geophysical data in selected areas. No geophysical or geochemical data was obtained from the Northeast Quarter. This option was terminated in 1969.

In 1970 the majority of the Chataway Exploration Co. property with the exception of the Southeast Quarter (which was under option to Bethlehem Mining Corp.) was optioned to Asarco Exploration. The exploration program conducted by Asarco consisted of geological

mapping of the east half of the Northeast Quarter and a gridded percussion drilling of the optioned property. Twelve percussion holes were collared in the Northeast Quarter. Of these twelve, two were unable to reach bedrock due to extreme overburden depth. No economic mineralization was encountered in either the percussion drilling or the geological survey. The option was subsequently terminated in 1971.

GENERAL GEOLOGICAL SETTING

Geological mapping of the Northeast Quarter was conducted by King Resources Co. at 1000 ft. scale and by Asarco at 400 ft. scale. Both surveys indicate that the area is underlain by rocks of the Chataway, Dot (Witches Brook "B") and Hybrid or gabbroic phases of the Guichon Batholith.

Outcrops in this area are scarce occupying less than 5% of the total surface area. As a result contact zones between the Chataway and Dot rock types have only been definitely located in the southern section of the Northeast Quarter where there is an increase in outcrop occurrence and adequate percussion drill hole information.

For the same reason geologic evidence of other forms of structural and tectonic activity in this area is non-existent.

GEOPHYSICS

INSTRUMENTATION AND SURVEY PROCEDURE

Instrumentation for the induced polarization survey consisted of a McPhar P654 frequency domain I.P. system operating at 0.31 and 5.0 Hz.

Notes on the theory, method of field operation, and presentation of data for the McPhar induced polarization method are included at the end of this report.

Presentation of the data from this survey is in two forms:

1. contoured pseudo-sections of resistivity, metal factor, and frequency effect (Drawings 1-19).
2. a plan map of the survey area indicating definite, probable and possible anomalies by solid, broken and slanted broken bars respectively (Drawing 20).

A dipole-dipole electrode configuration was employed throughout the survey. Electrode separation was maintained at 200 ft. with multiple spacings to 800 ft. ($n=4$) about each survey station. This method resulted in the collection of 15,791 readings.

DISCUSSION OF RESULTS

(A) RESISTIVITY DATA

Resistivity data, throughout the survey area, was relatively inhomogeneous with a mean response magnitude of approximately 200 ohm-ft. and maximum and minimum of 520 ohm-ft. and 34 ohm-ft. respectively.

The data appears to have no spatial relationship whatsoever to the two principal rock types underlying the survey area.

One anomalous resistivity feature is evident however. A linear resistivity depression (minimum response 38 ohm-ft.) trending north and centred about 344W to 346W extends from the north end of Dot Lake

to L330N. It becomes inconsistent and weaker from L322N to L330N. It is possible that this resistivity depression is a function of a fault or zone of alteration.

(B) INDUCED POLARIZATION DATA

NOTE:

Frequency effect data has, in all cases, been used for interpretational purposes. It was felt that due to the erratic nature of the resistivity data and the weak induced polarization effects encountered the usefulness of the metal factor parameter was negated.

Background frequency effect for the surveyed area has been visually estimated to be $1.2 \pm 2\%$. Frequency effects equal to or greater than 2.0% (slightly greater than $1.5 \times$ background) have been arbitrarily designated as 1st order or possibly anomalies.

Using this criterion three anomalous zones and four "one-line" anomalies have been located. These shall be discussed individually.

ZONE I

This zone is the largest of the three anomalous zones located. It extends from L278N to L330N and is continuous from L306N to L330N. This zone has a maximum possible length of 5400 ft. and width of 3000 ft. (on L322N).

This zone is characterized by broad, continuous, weak anomalies in the northern section decaying to shorter, discontinuous, weak anomalies in the southern section (ie. below L306N).

Frequency effects across the majority of the zone are relatively homogeneous but not strong usually averaging $2.4 + 2\%$ or approximately twice background. The strongest frequency effect anomaly is located on L278 centred about 33W. It has an average frequency effect response of 2.8% and a peak response of 3.5%.

Depths to the causative body or bodies of this zone vary from less than or equal to 100 ft. to less than or equal to 225 ft. but in the main average less than or equal to 175 ft.

Resistivity response throughout the zone is quite erratic with no definite, continuous resistivity depressions correlating with the anomalies. The responses are, however, relatively strong averaging 150 - 200 ohm-ft., indicating a relatively tight, non-porous nature of the underlying country rock.

This zone straddles or lies to the immediate west of an inferred contact zone between the Chataway and Dot rock types. It is also positioned to the immediate west of the anomalous resistivity depression mentioned in (A).

Previous percussion drilling by Asarco (1970) did not penetrate this zone. There are, however, three percussion holes collared around the periphery of the zone with the nearest being 150 ft. to the west. None of these holes indicating any appreciable amounts of copper or molybdenum. Minor amounts of potassic feldspar and sericite alteration, and magnetite were noted.

ZONE 2

Zone 2 consists of two anomalies located on lines 278N and 282N immediately north of Dot Lake. Both anomalies are quite weak and average approximately 2.5% frequency effect.

Depth to the causative body of this zone is equal to or less than 100 ft.

Both anomalies are coincident with relatively low resistivity responses (minimum = 34 ohm-ft. on L282N). This suggests that the anomalies are possibly coincident with a localized shear or alteration zone.

This zone is lying in an area which is supposedly underlain by Dot phase rocks and to the immediate east of the inferred contact zone between the Chataway and Dot phases, and the previously mentioned resistivity depression.

ZONE 3

Zone 3 is situated in the northeast corner of the survey grid and consists of two anomalies on line 326N and 330N. Both anomalies are quite weak averaging approximately 1.8% frequency effect.

Although not strictly meeting the designated criterion for first order or possible anomalies this zone has been deemed possible anomalous for the following reasons:

1. the surrounding frequency effects are extremely low (less than 1%).
2. both anomalies are coincident with low resistivity responses.

Depths to the causative body or bodies of this zone is equal to or less than 100 ft.

This zone lies within an area underlain by Dot place rocks.

A percussion hole 600 ft. to the north of this zone (Asarco 1970) contained no appreciable amounts of copper or molybdenum mineralization. Potassic feldspar and sericite alteration was noted however.

LINE 302E, 290N, 374+50E - 377E

This anomaly has a peak frequency effect of 2.3%. It is coincident with a relatively large resistivity response.

Depth to the causative body is equal to or less than 250 ft.

LINE 278N, 375 - 50E - 379 + 50E

This anomaly has a peak frequency effect of 3.0% and averages approximately 2.4%.

It is coincident with a relative resistivity depression however, it is not obvious whether this depression is attributable to the same cause as that of the induced polarization anomaly.

Depth to the causative body is less than or equal to 225 ft.

LINE 258N, 309E - 318 + 50E

This anomaly has a peak frequency effect of 2.8% and averages 2.2%.

It is coincident with an area of relatively high resistivity responses averaging approximately 350 ohm-ft., which indicate a relatively tight non-porous country rock.

Depth to the causative body is equal to or less than 225 ft.

NOTES ON THE THEORY, METHOD OF FIELD OPERATION AND PRESENTATION
OF DATA FOR THE INDUCED POLARIZATION METHOD.

Induced polarization (in a geophysical exploration sense) involves electro-chemical processes which take place when current flows from an electrolyte (ionic conduction) into a metal (electronic conduction) or vice-versa.

Normally, when current is passed through the ground, all of the conduction takes place through ions present in the interstitial fluid content of the rock. If, however, the interstices are blocked by metallic particles this ionic conduction will be "blocked" as the mode of conduction attempts to change from ionic to electronic. Thus, there will be an ion build up at the boundary with a resulting charge polarization. The amount of blocking action or induced polarization will depend upon the chemical energies necessary to allow the ions to give up or receive electrons from the metallic surface and increases with time that a D.C. current is allowed to flow through the rock. This blocking action is analogous to the introduction of a capacitance to a purely resistive circuit.

If an A.C. Signal is applied to the system the effective impedance of the system is found to decrease with increasing frequency. Thus, apparent resistivity measurements made at two frequencies would be different from each other. The larger the differences, the larger the frequency dependance. And since the frequency dependance is brought about by the introduction of a capacitance into a purely resistive system the larger the frequency dependance, the greater is the capacitance, i.e., the induced polarization effect. This then is the so-called frequency effect quantity and is non-dimensional. Metal factor values are obtained by normalizing the frequency effect values with respect to the varying resistivities.

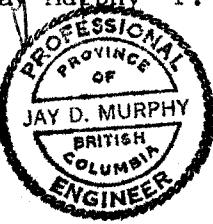
In the field procedure measurements in the surface are made in such manner as to allow the effects of lateral changes in the properties of the ground to be separated from the effects of vertical changes in the properties. Current is applied to the ground at two points a distance (x) apart. The potentials are measured at two other points (x) feet apart and in line with the current electrodes and separated from them by an integer number (n) times the basic distance (x). Usually several traverses are made along the survey line with various values of (n) i.e., (n) = 1, 2, 3 and 4.

The method of plotting the results is diagrammatically depicted in the accompanying figure.

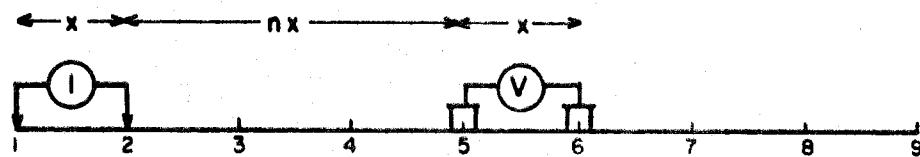
Dated at Kamloops

February 29, 1972

Garry R. Brace
Garry R. Brace B. Sc.
Jay Murphy
Jay Murphy P. Eng.



**METHOD USED IN PLOTTING DIPOLE-DIPOLE
INDUCED POLARIZATION AND RESISTIVITY RESULTS**



Stations on line

x = Electrode spread length

n = Electrode separation

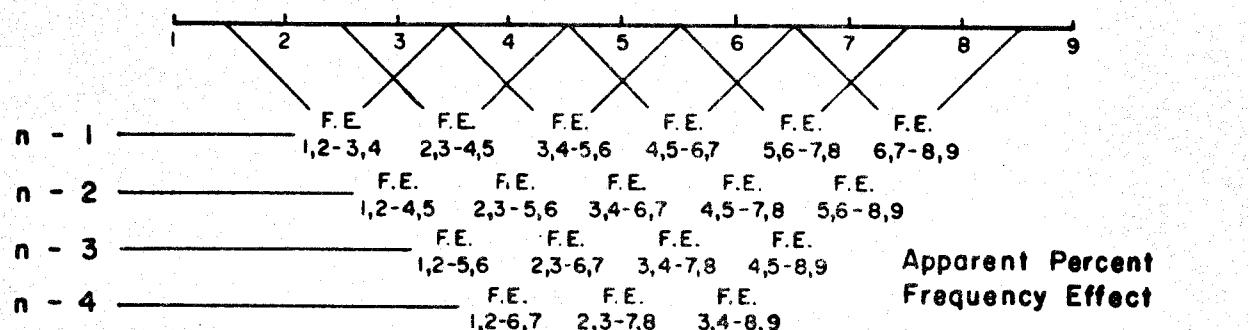
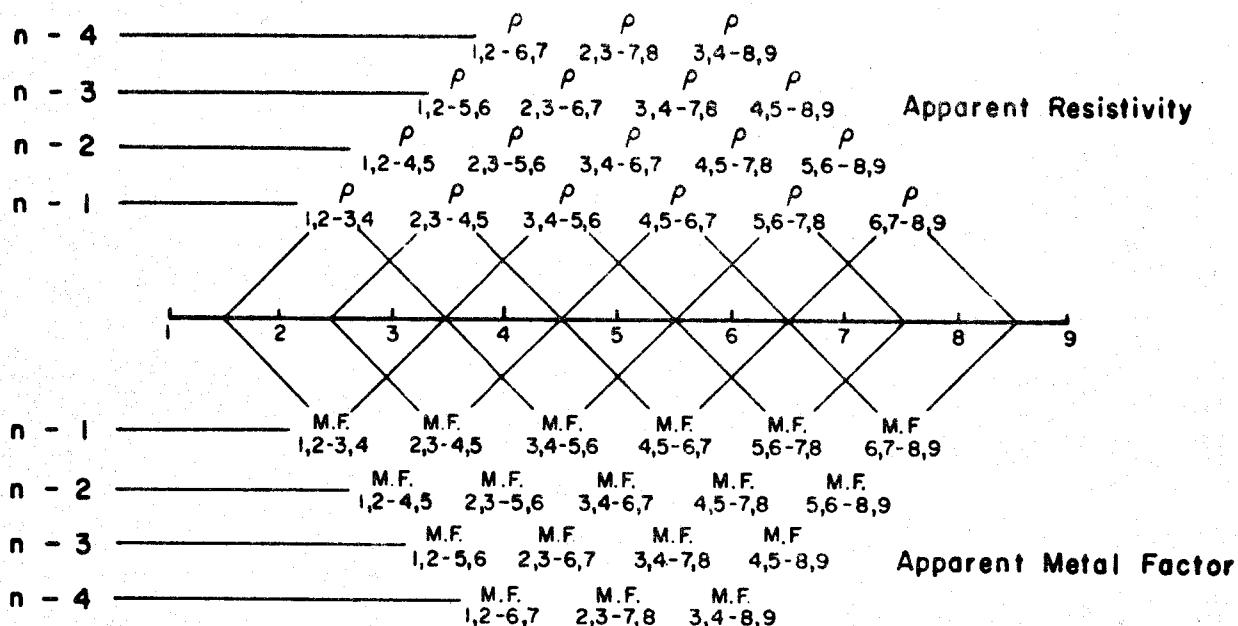


Fig. A

APPENDIX I

ASSESSMENT DETAILS

PROPERTY: Dot Lake, Corner, Chataway Lake Supplemental, and Cougar Lake Supplemental Claim groups.

OWNER: Canadian Superior Exploration Ltd. 2201-1177 West Hastings St., Vancouver 1, B. C.

LOCATION: Highland Valley area, near Chataway Lake. Kamloops and Nicola Mining Divisions, British Columbia.

NUMBER OF CLAIMS: 155

NATURE OF SURVEYS: Induced Polarization

INSTRUMENT: McPhar P654 I. P. system.

LINE MILES SURVEYED: 42

APPENDIX II

LABOUR COST BREAKDOWN

	<u> DAYS </u>	<u> RATE </u>	<u> TOTAL </u>
SUPERVISORY PERSONNEL			
W. Rainboth (Geologist)	21 x	\$ 60	\$ 1,260.
G. Brace (Geophysicist)	101 x	30	3,030.
GEOPHYSICAL PERSONNEL			
K. Cozens (Field Technician)	69 x	25	1,725.
B. Martin (Transmitter Operator)	68 x	20	1,360.
G. Redd (Helper)	74 x	20	1,480.
G. Pollard (Helper)	42 x	20	840.
R. McDonald (Helper)	55 x	20	1,100.
J. Martin (Helper)	39 x	20	780.
A. Berke (Helper)	7 x	20	140.
B. Major (Line cutting)	7 x	20	140.
T. Lesperance (Line Cutting)	26 x	20	520.
CAMP MAINTENANCE PERSONNEL			
R. Allen	76 x	20	<u>1,520.</u>
	TOTAL		<u>\$ 13,895.</u>

APPENDIX III

COST STATEMENT

LABOUR

Salaries as per appendix II. \$13895

TRANSPORTATION

Company vehicle (unit 4) \$ 1800

INSTRUMENT RENTAL

McPhar P654 I. P. system \$ 4000

DRAUGHTING

\$ 400

BOARD AND LODGING

\$ 3402

OTHER

Cat Rental for snow removal \$ 1200

TOTAL

\$24697

APPENDIX IV

CERTIFICATE

I, Garry R. Brace, of the city of Kamloops, Province of British Columbia, do hereby certify that:

1. I am a Geophysicist resident at 207-1956 Curlew Road, Kamloops, British Columbia.
2. I am a graduate of the University of British Columbia (1971) with a B. Sc. degree in Geophysics.
3. I have been practising my profession for one year.
4. I am a member of the Society of Exploration Geophysicists.

Dated at Kamloops

This 29th day of February 1972

Garry R. Brace

Garry R. Brace, B. Sc.



Φ 308 E

Φ 350 E

Φ 380 E

L 330 N

L 326 N

L 322 N

L 318 N

L 314 N

L 310 N

L 306 N

L 302 N

L 298 N

L 294 N

L 290 N

L 286 N

L 282 N

L 278 N

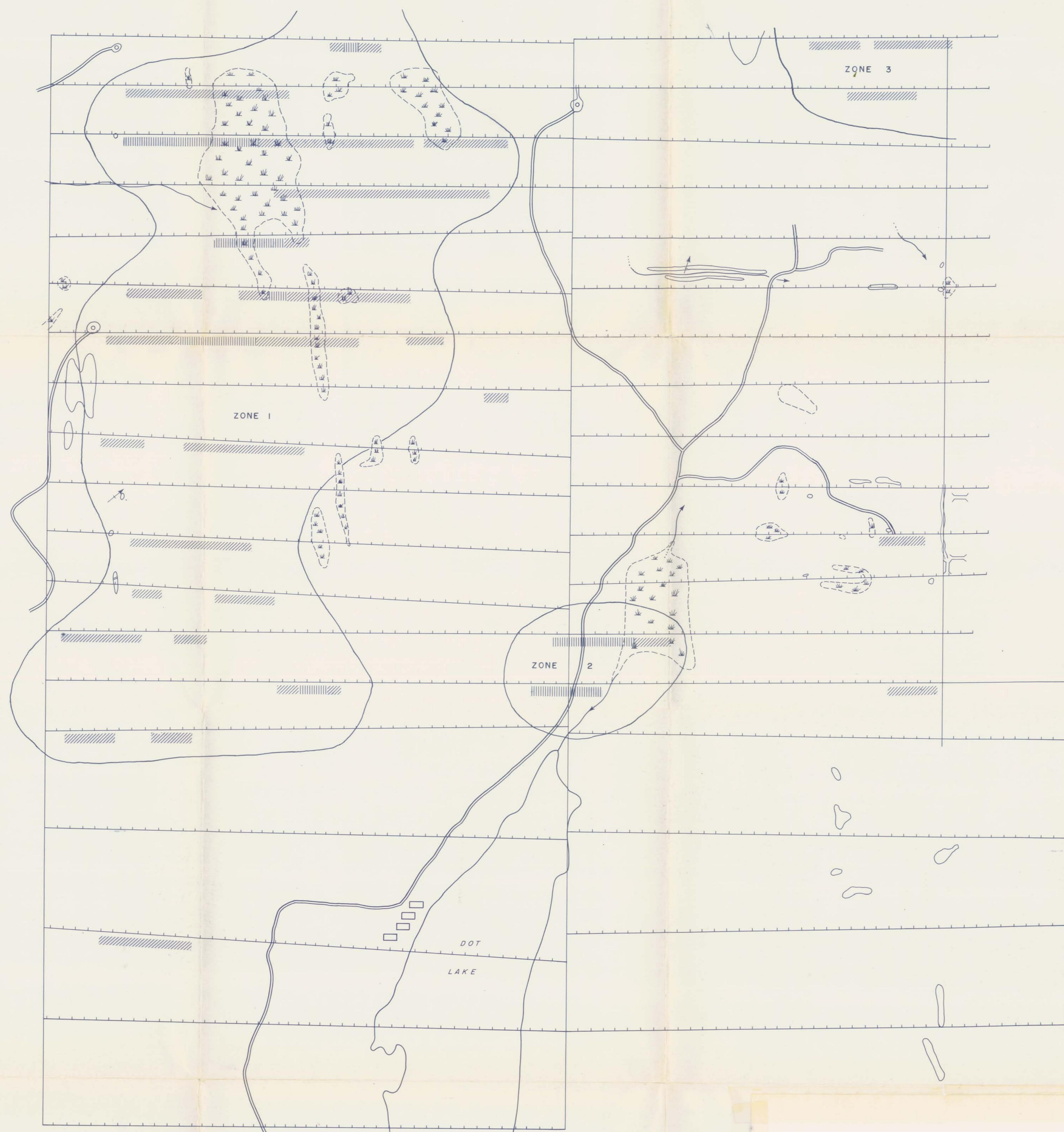
L 274 N

L 266 N

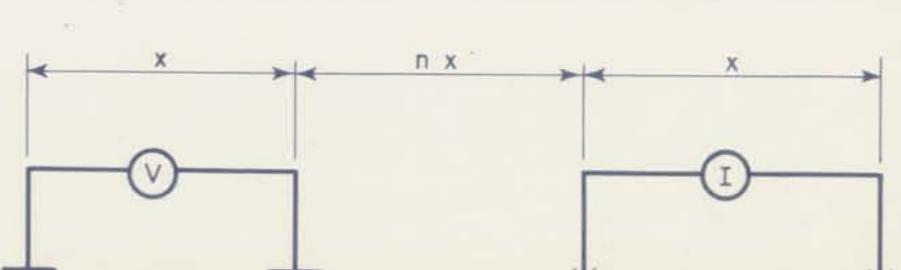
L 258 N

L 250 N

L 242 N



INSTRUMENT : McPhar P 654 I.P. Unit
ELECTRODE ARRAY : Dipole - Dipole

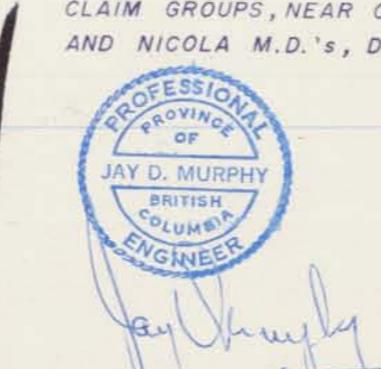


SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE



TO ACCOMPANY GEOPHYSICAL REPORT BY G.BRACE,
ON THE COUGAR LAKE SUPPLEMENTAL, CHATAWAY
LAKE, MERRITT, CORNER, AND DOT LAKE
CLAIM GROUPS, NEAR CHATAWAY LAKE, KAMLOOPS
AND NICOLA M.D.'S, DATED FEB. 29, 1972.



3552 M-1

CANADIAN SUPERIOR EXPLORATION LTD.,
KAMLOOPS BRITISH COLUMBIA

CHATAWAY PROJECT
Kamloops & Nicola M.D.'s

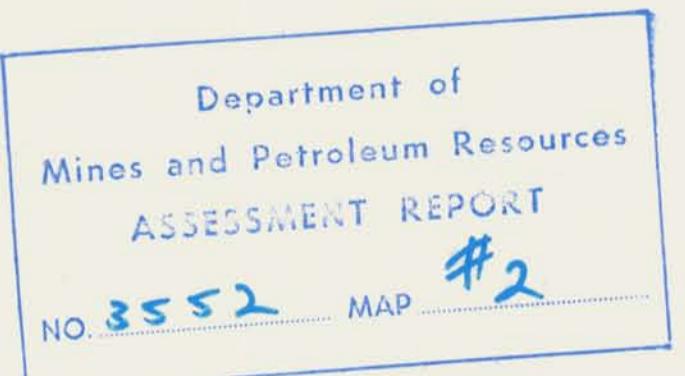
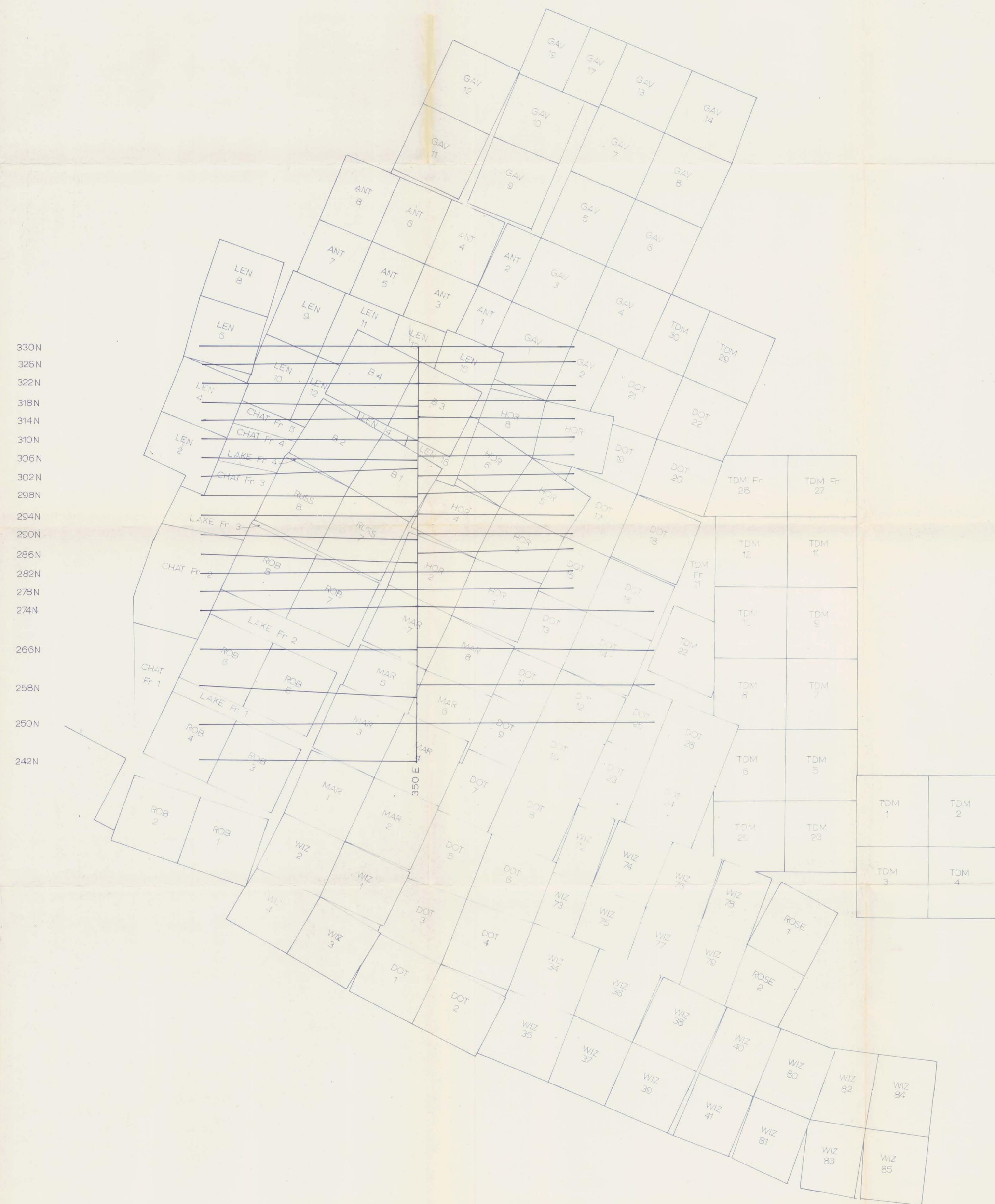
I.P. GRID & ANOMALY PLAN

CANADIAN SUPERIOR EXPLORATION CO. LTD.

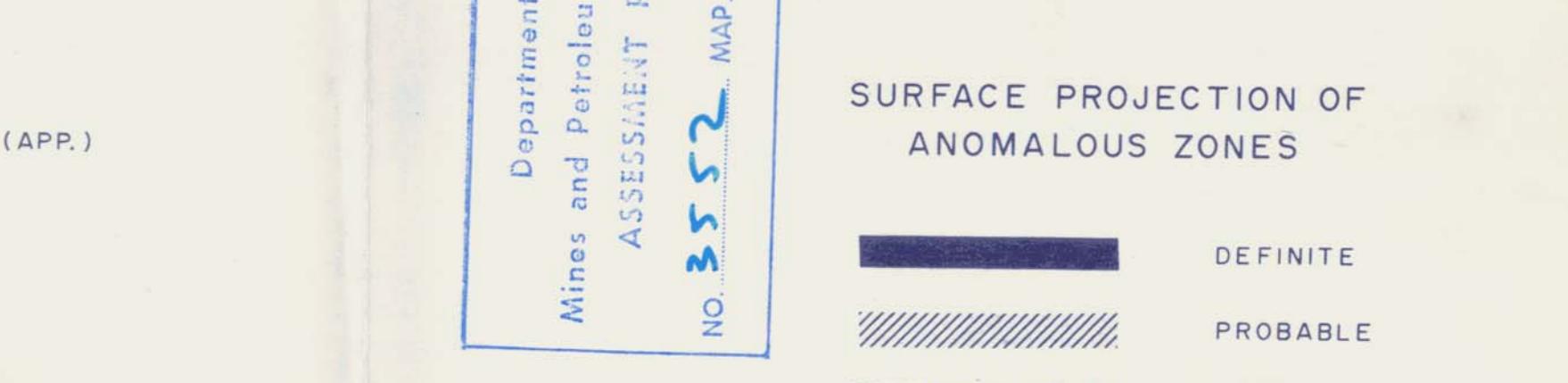
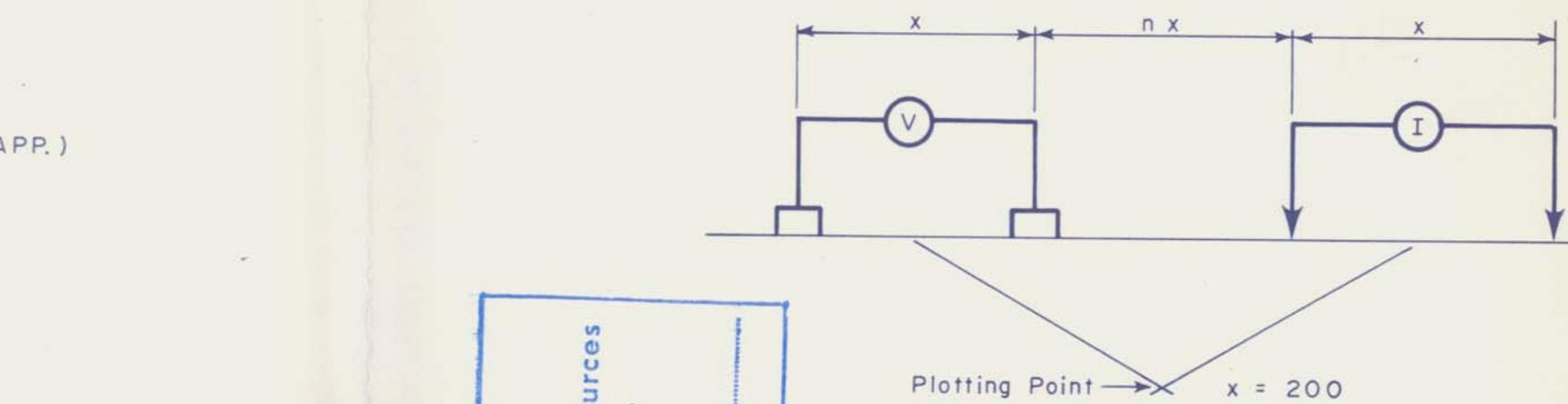
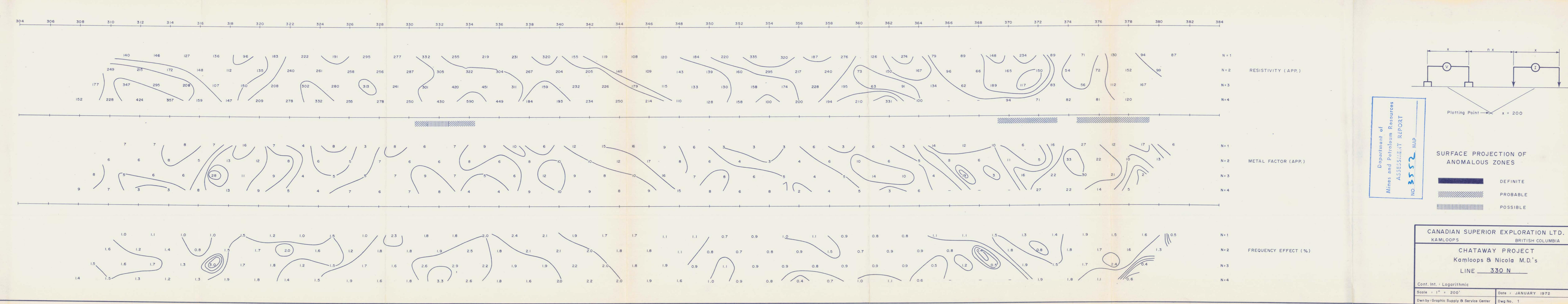
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(Kamloops & Nicola M.D.)

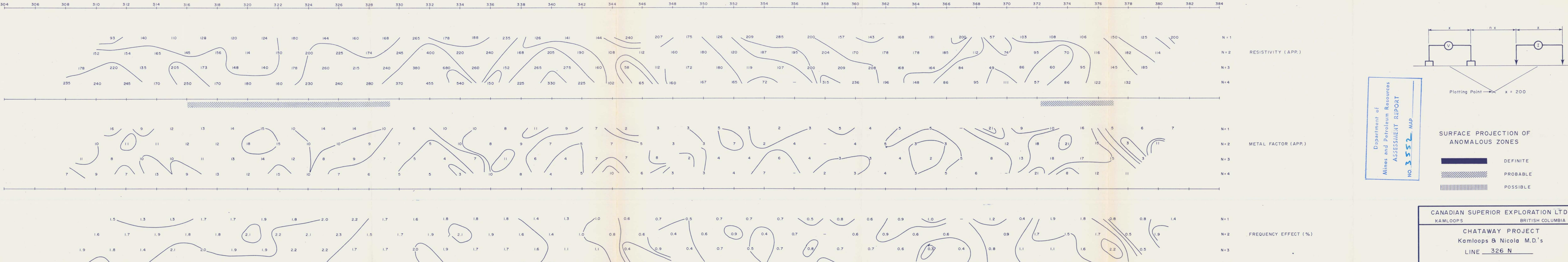
CLAIM & I.P. GRID PLAN

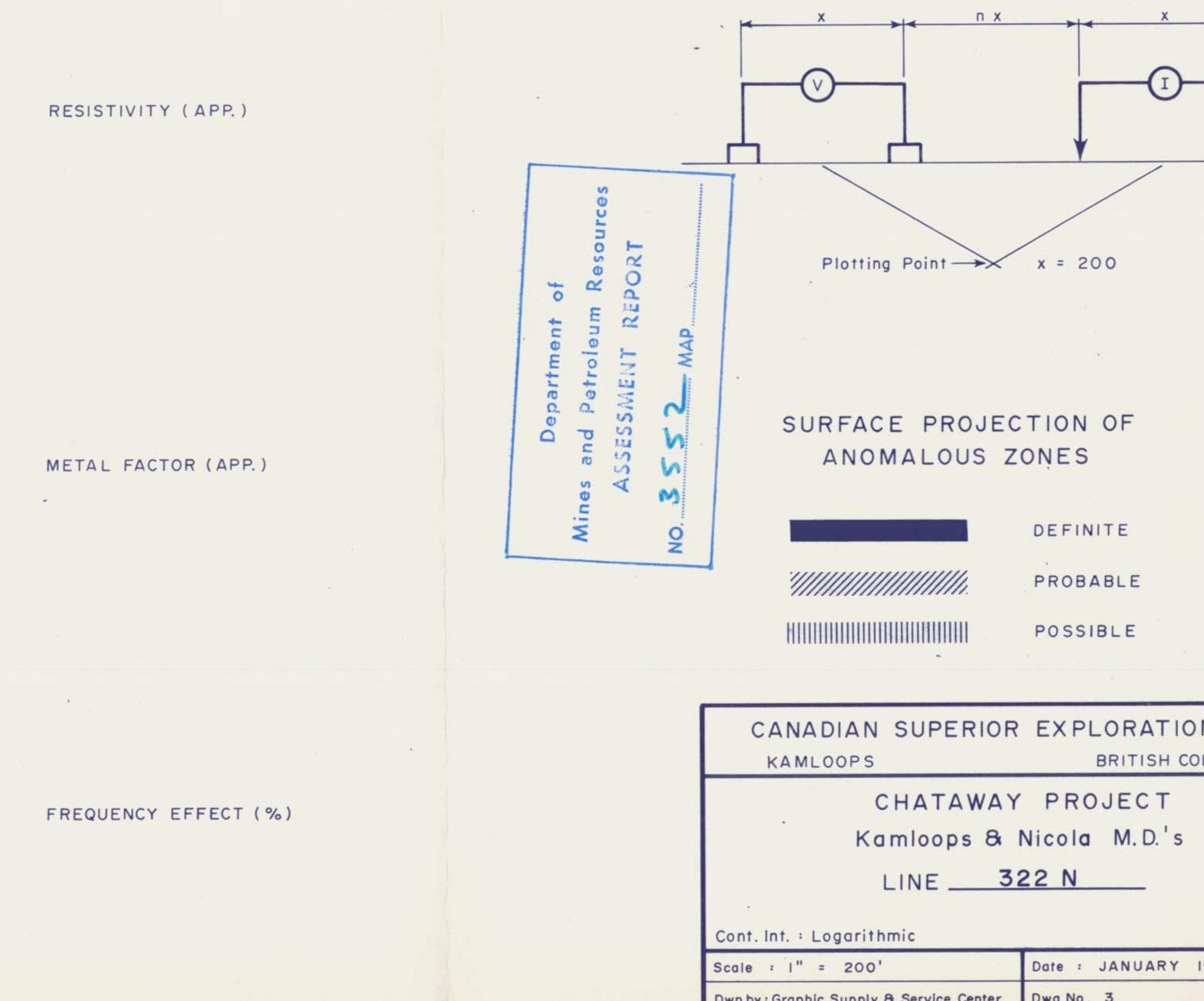
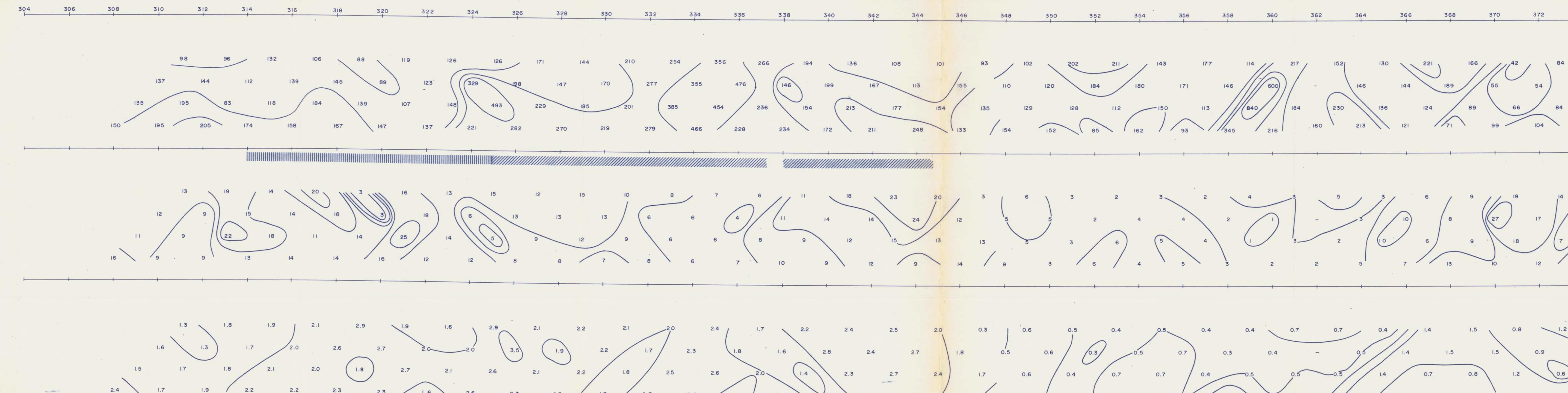
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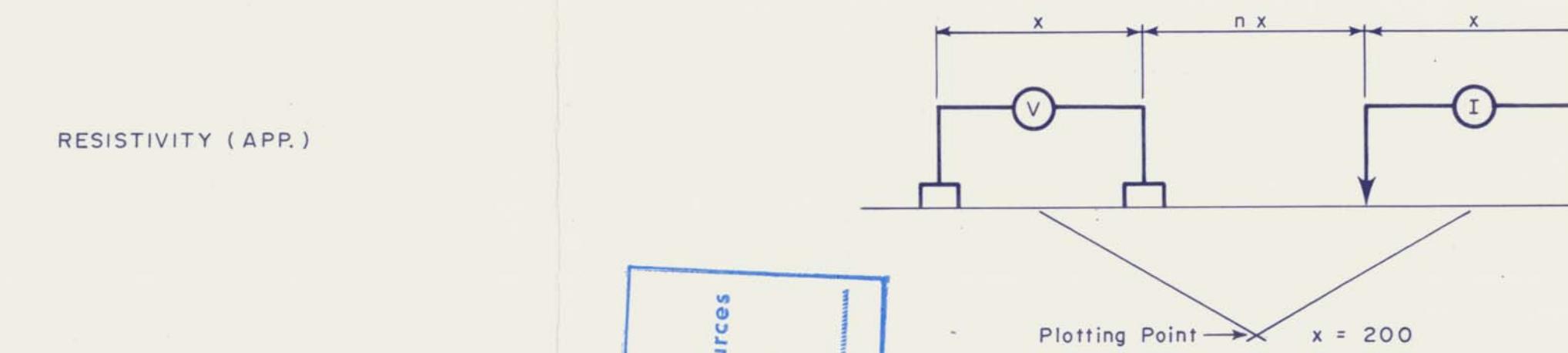
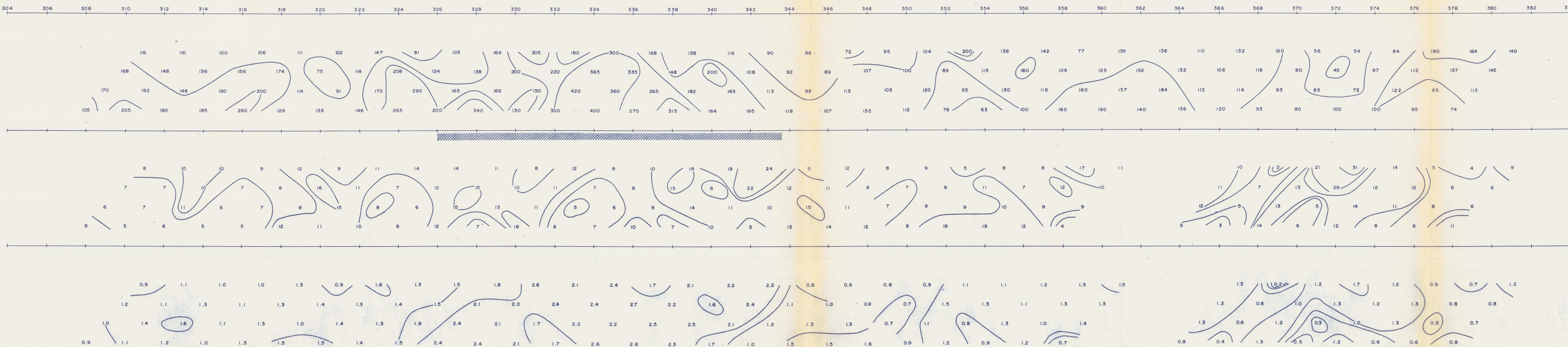


TO ACCOMPANY GEOPHYSICAL REPORT BY G. BRACE,
ON THE COUGAR LAKE SUPPLEMENTAL, CHATAWAY
LAKE SUPPLEMENTAL, CORNER, AND DOT LAKE
CLAIM GROUPS, NEAR CHATAWAY LAKE, KAMLOOPS
AND NICOLA M.D.'S, DATED: FEB. 29, 1972.
Dwg. No. 21









METAL FACTOR (APP.)



CANADIAN SUPERIOR EXPLORATION L
KAMLOOPS BRITISH COLUMBIA
CHATAWAY PROJECT
Kamloops & Nicola M.D.'s
LINE 318 N

304 306 308 310 312 314 316 318 320 322 324 326 328 330 332 334 336 338 340 342 344 346 348 350 352 354 356 358 360 362 364 366 368 370 372 374 376 378 380 382 384

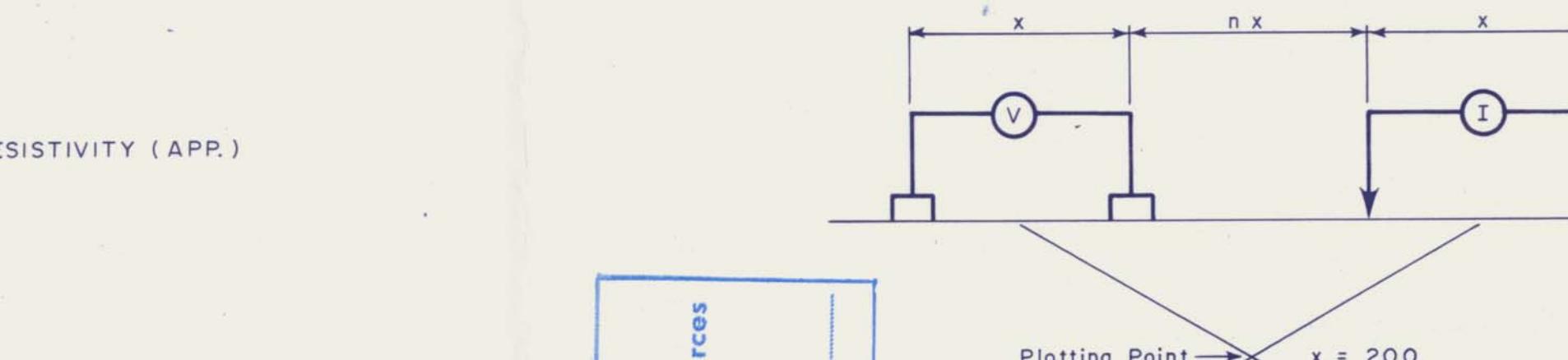
N = 1

N = 2

N = 3

N = 4

RESISTIVITY (APP.)



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3552 MAP

SURFACE PROJECTION OF
ANOMALOUS ZONES

DEFINITE
PROBABLE
POSSIBLE

N = 1

N = 2

N = 3

N = 4

METAL FACTOR (APP.)

CANADIAN SUPERIOR EXPLORATION LTD.
KAMLOOPS BRITISH COLUMBIA
CHATAWAY PROJECT
Kamloops & Nicola M.D.'s
LINE 314 N
Cont. Int. : Logarithmic
Scale : 1" = 200' Date : JANUARY 1972
Dwg No. 5

N = 1

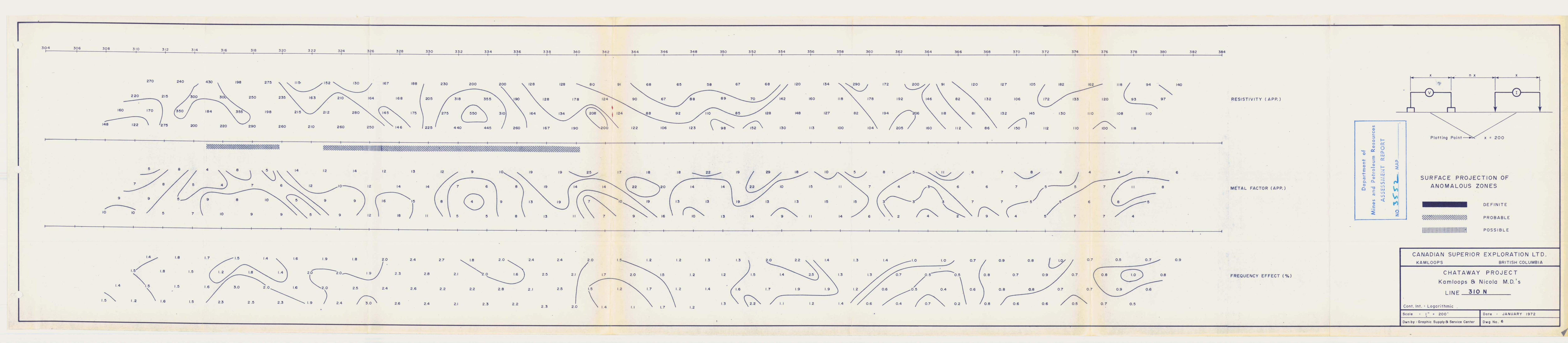
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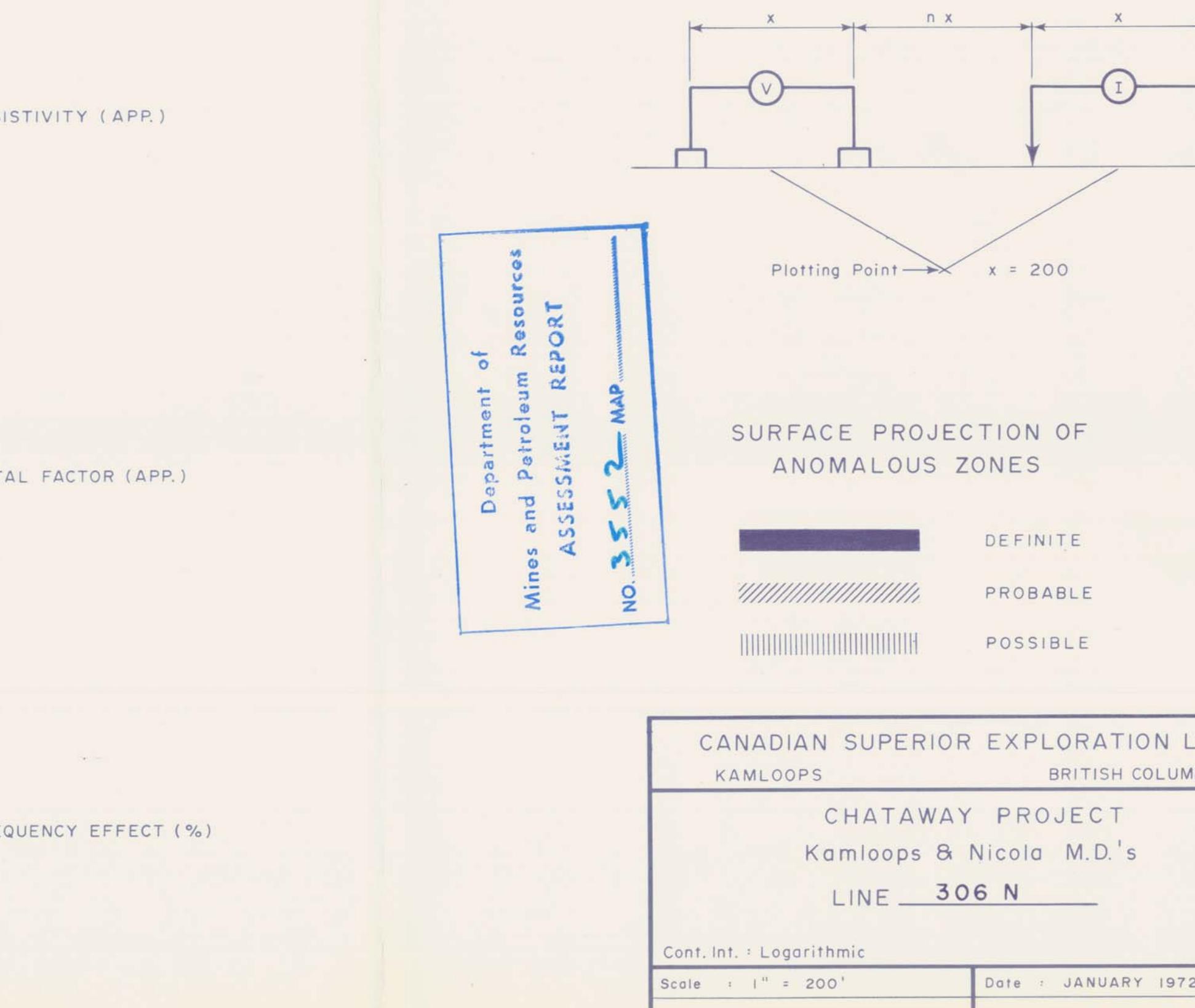
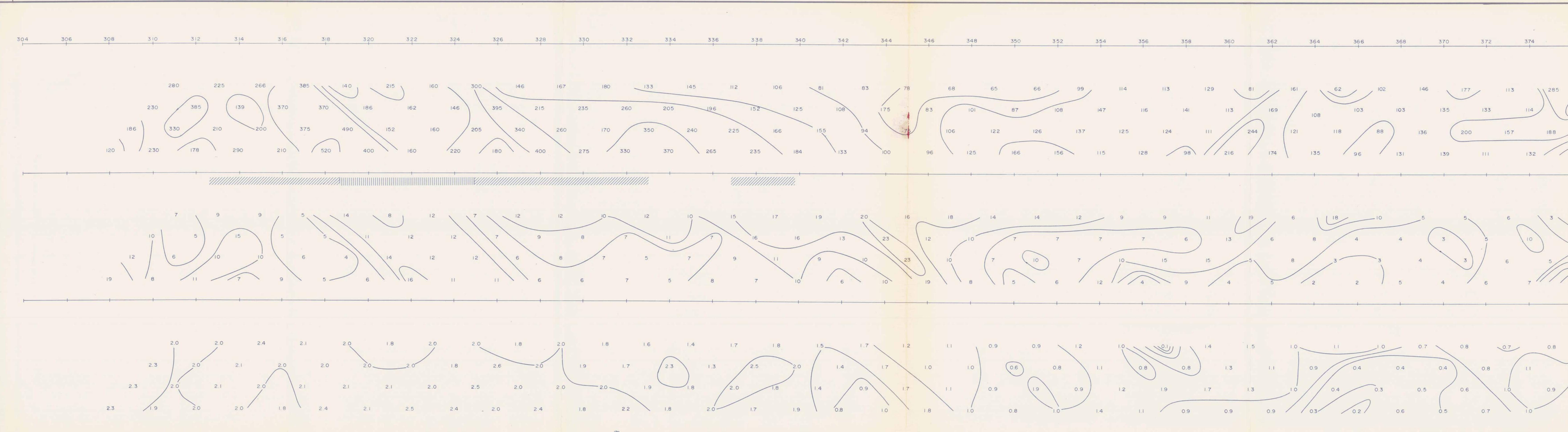
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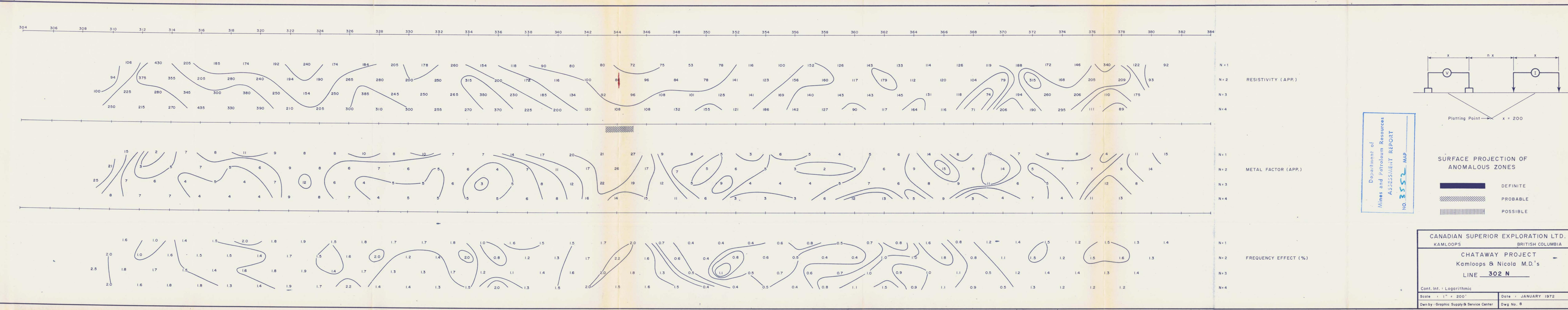
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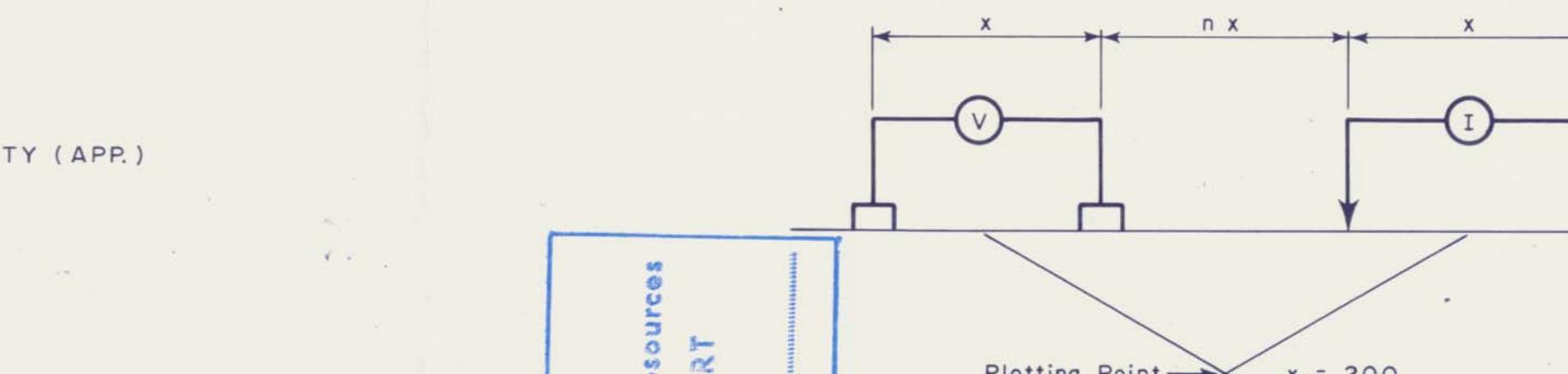
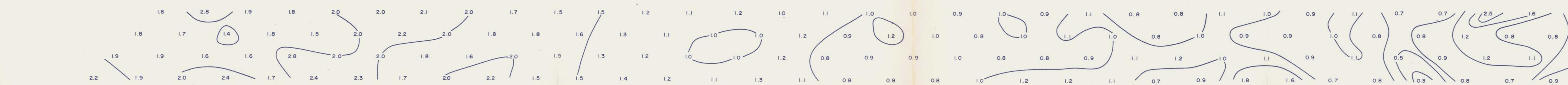
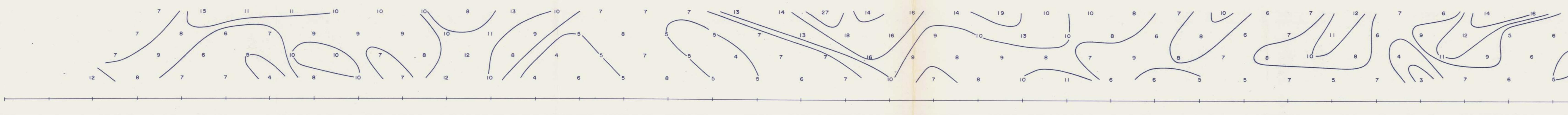
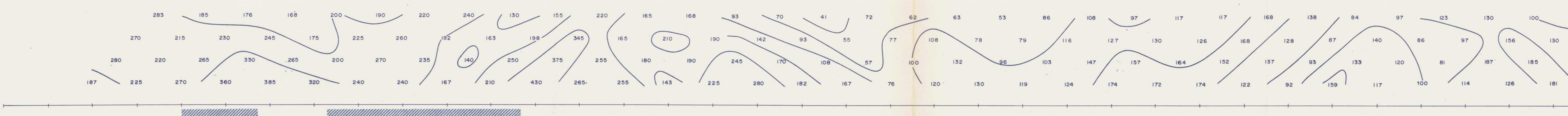
FREQUENCY EFFECT (%)

Plotting Point
x = 200

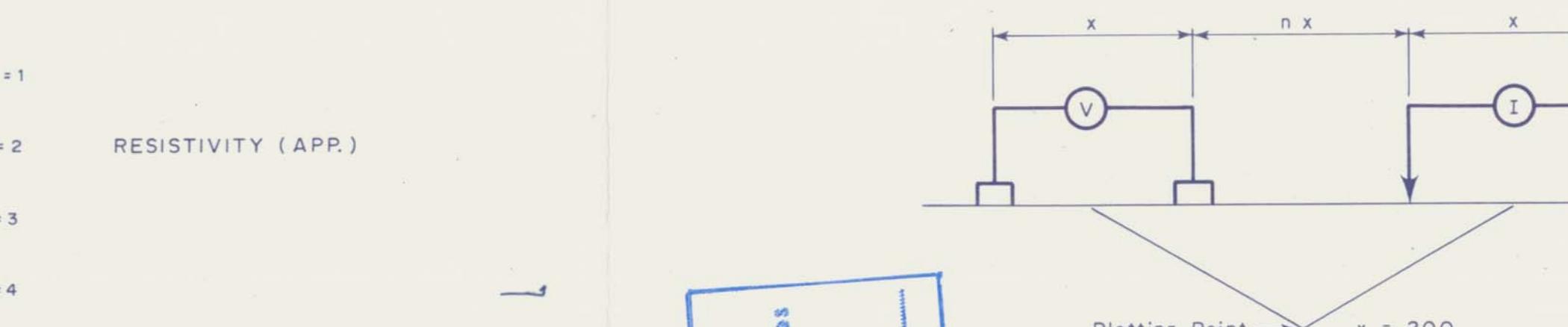
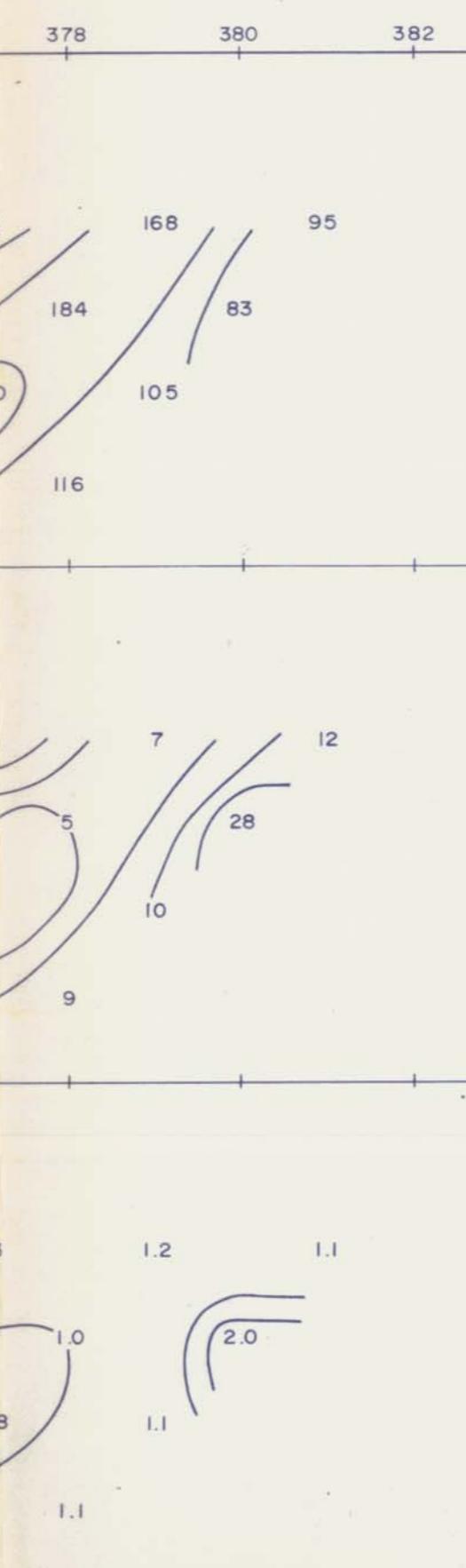
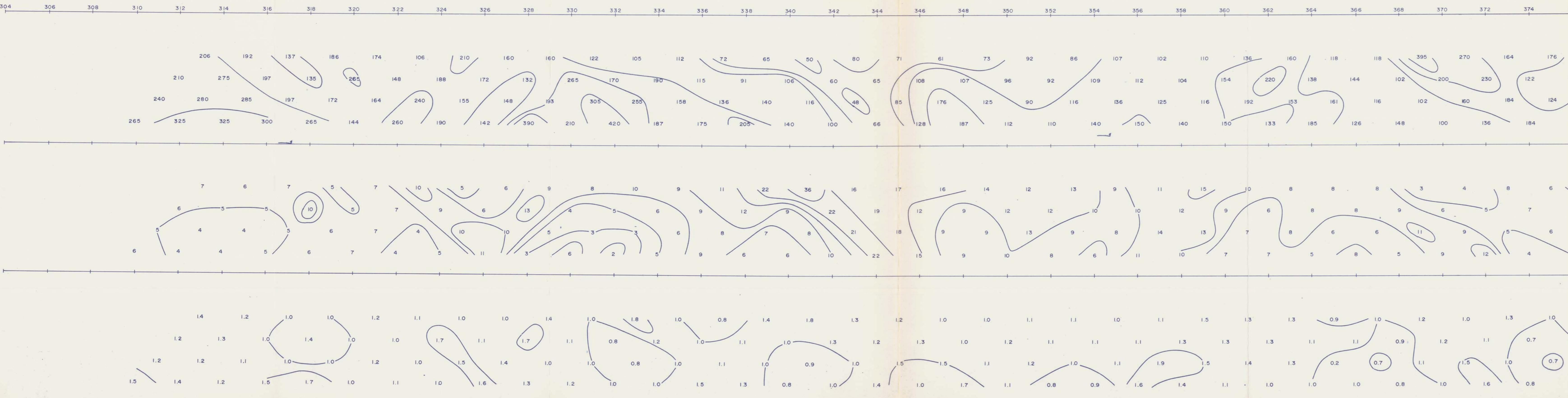






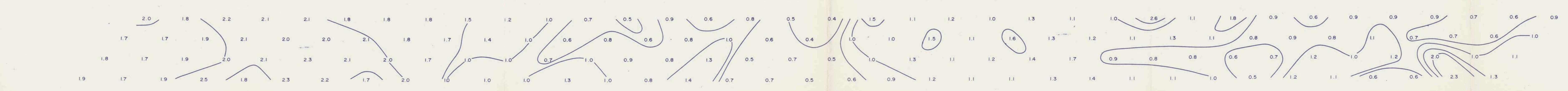
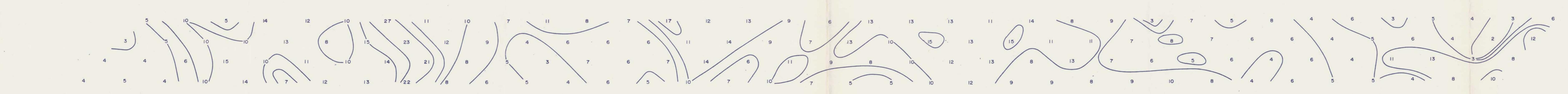
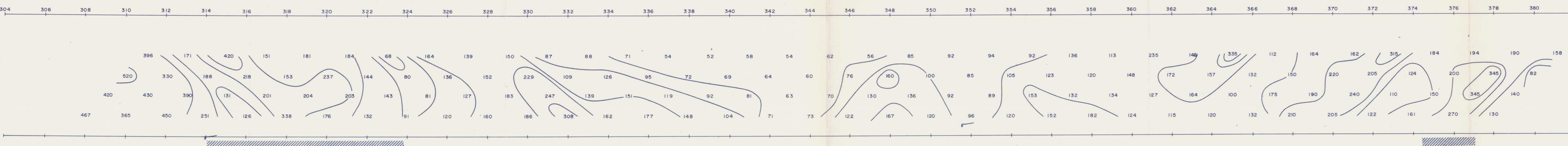


**SURFACE PROJECTION
ANOMALOUS ZONES**

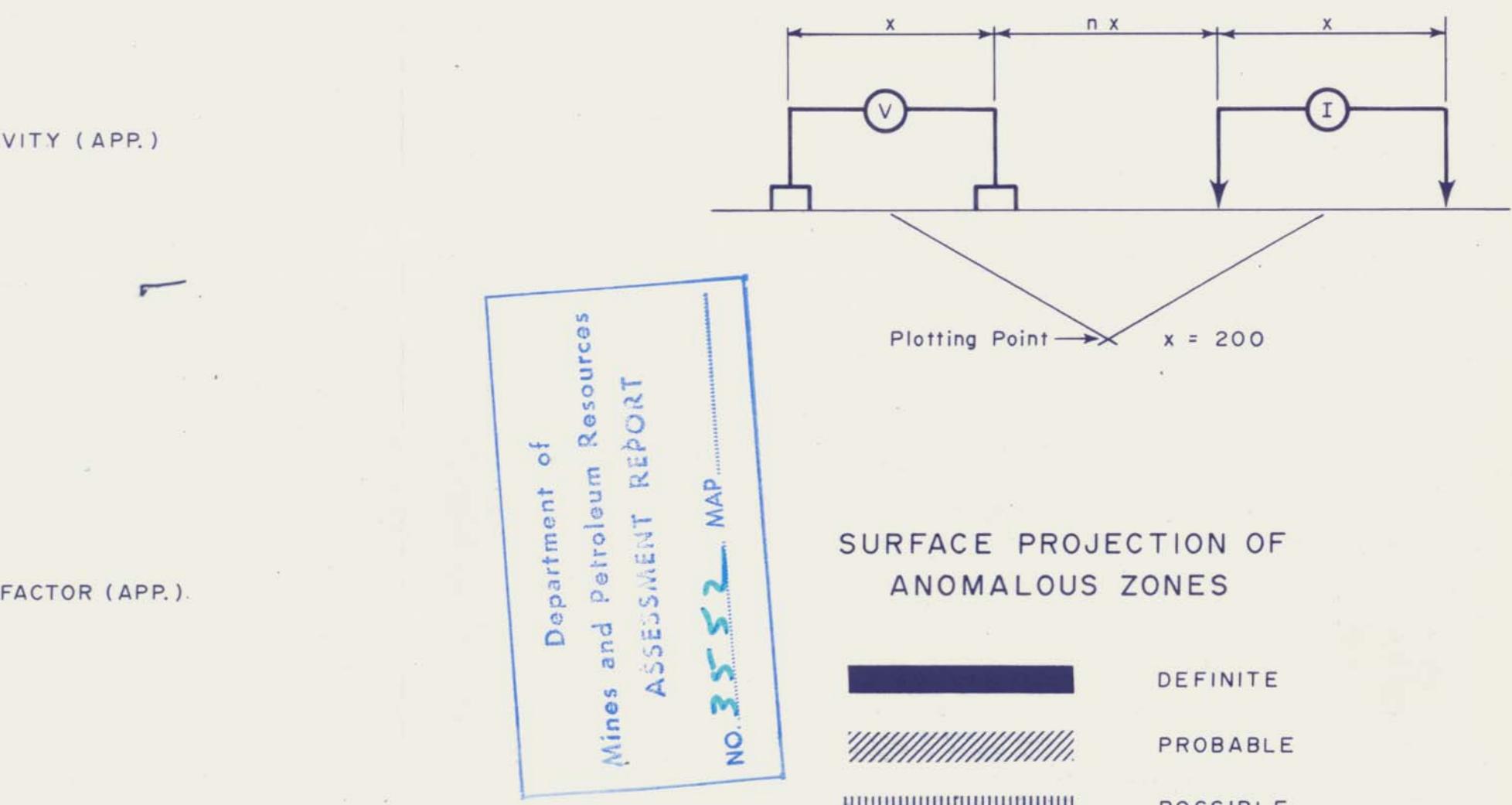


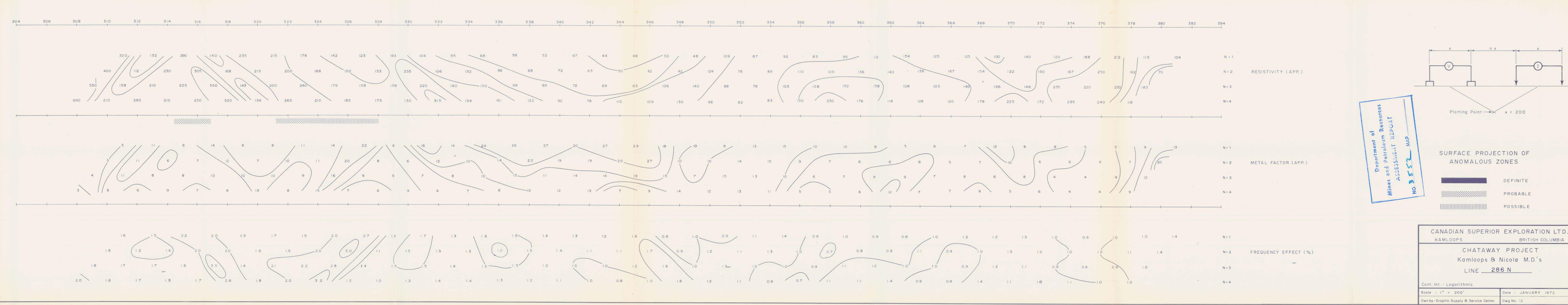
**SURFACE PROJECTION
ANOMALOUS ZONES**

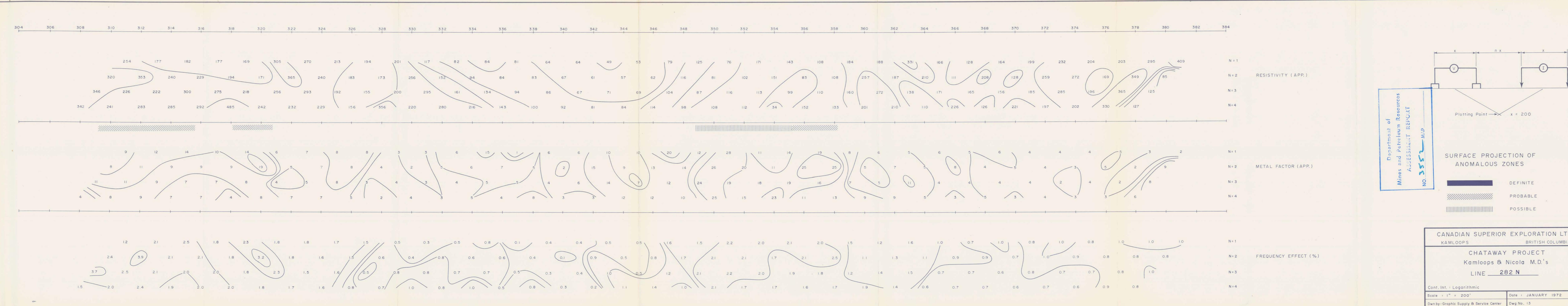
CANADIAN SUPERIOR EXPLORATION	
KAMLOOPS	BRITISH COL
CHATAWAY PROJECT	
Kamloops & Nicola M.D.'s	
LINE <u>294 N</u>	
Cont. Int. : Logarithmic	
Scale : 1" = 200'	Date : JANUARY 1
Dwn by : Graphic Supply & Service Center	Dwg No. 10



N = 1	CANADIAN SUPERIOR EXPLORATION LTD.	
	KAMLOOPS	BRITISH COLUMBIA
N = 2	CHATAWAY PROJECT	
	Kamloops & Nicola M.D.'s	
N = 3	LINE <u>290 N</u>	
N = 4	Cont. Int. : Logarithmic	
	Scale : 1" = 200'	Date : JANUARY 1972
	Dwn by: Graphic Supply & Service Center	Dwg No. 11







1



